

Application No.: 10/601,658Docket No.: 2336-180**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A film bulk acoustic resonator (FBAR) device, comprising:
a substrate structure having provided with an upper surface;
a seed layer formed on the upper surface of the substrate structure and consisting essentially of ~~made of~~ one metal selected from the group consisting of gold (Au) and titanium (Ti); and
one or more acoustic resonant portions, each including a lower electrode film formed on the seed layer and made of molybdenum (Mo), a piezoelectric layer formed on the lower electrode film and made of aluminum nitride (AlN), and an upper electrode film formed on the piezoelectric layer.
2. (currently amended) The FBAR device as set forth in claim 1, further comprising a layer made of tantalum (Ta) and formed between the seed layer and the substrate structure, wherein in case that the seed layer is made of Au.
3. (original) The FBAR device as set forth in claim 1, wherein the upper electrode film is made of Mo.
4. (currently amended) The FBAR device as set forth in claim 1, wherein the substrate structure is a substrate having provided with air gaps formed on [[its]] an upper surface thereof.
5. (currently amended) The FBAR device as set forth in claim 4, comprising

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multiple said wherein the acoustic resonant portions, wherein are plural in number, and the air gaps are formed on the substrate at positions corresponding to each of the acoustic resonant portions.

6. (currently amended) The FBAR device as set forth in claim 1, wherein the substrate structure includes

a substrate having provided with a flat upper surface, and
a membrane layer provided with an air gap formed on the upper surface of the substrate to define an air gap therebetween.

7. (currently amended) The FBAR device as set forth in claim 1, wherein the substrate structure includes

a substrate having provided with a flat upper surface,
a membrane support layer formed on the upper surface of the substrate so that an air gap is surrounded by the membrane support layer, and
a membrane layer formed on [[the]] an upper surface of the membrane support layer so as to define an that the air gap between the membrane layer and the substrate, wherein said air gap is covered by the membrane layer and surrounded by the membrane support layer.

8. (currently amended) The FBAR device as set forth in claim 6, wherein the membrane layer is made of a silicon nitride or a silicon oxide.

9. (currently amended) A film bulk acoustic resonator (FBAR) device, comprising:
a substrate structure having an upper surface;
a seed layer formed on the upper surface of the substrate structure and made of one selected from gold (Au) and titanium (Ti); and
one or more acoustic resonant portions, each including a lower electrode film formed on the seed layer and made of molybdenum (Mo), a piezoelectric layer formed on the lower electrode film

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and made of aluminum nitride (AlN), and an upper electrode film formed on the piezoelectric layer;

The FBAR device as set forth in claim 1,

wherein the substrate structure is a reflective layer in which two or more layers with different impedances are alternately stacked.

10. (currently amended) A method [[for]] of producing a film bulk acoustic resonator (FBAR) device, said method comprising the steps of:

- (a) preparing a substrate structure having provided with an upper surface;
- (b) forming a seed layer consisting essentially of made of one metal selected from the group consisting of gold (Au) and titanium (Ti) on the upper surface of the substrate structure; and
- (c) forming one or more acoustic resonant portions by sequentially stacking a lower electrode film formed on the seed layer and made of molybdenum (Mo) on the seed layer, a piezoelectric layer formed on the lower electrode film and made of aluminum nitride (AlN) on the lower electrode film, and an upper electrode film formed on the piezoelectric layer.

11. (currently amended) The method for producing a FBAR device as set forth in claim 10, further comprising the step of

- (b') forming a layer made of tantalum (Ta) on the substrate structure before the step (b), wherein in case that the seed layer is made of Au.

12. (currently amended) The method for producing a FBAR device as set forth in claim 10, wherein the upper electrode film is made of Mo.

13. (currently amended) The method for producing a FBAR device as set forth in claim 10, wherein:

the step (a) includes:

- (a-1) preparing a substrate;

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(a-2) forming a cavity on [[the]] an upper surface of the substrate; and

(a-3) forming a sacrificial layer [[on]] in the cavity so that the upper surface of the substrate is flat; and

the method further comprises, after the step (c), the step of (d) removing the sacrificial layer so as to form an air gap.

14. (currently amended) The method ~~for producing a FBAR device~~ as set forth in claim 13, wherein:

a plurality of cavities are formed in the step (a-2); and

a plurality of acoustic resonant portions are formed, in the step (c), on the upper surface of the substrate in positions corresponding to the ~~so that the acoustic resonant portions correspond to~~ sacrificial layer forming positions in the step (e) formed in said cavities.

15. (currently amended) The method ~~for producing a FBAR device~~ as set forth in claim 10, wherein:

the step (a) includes:

(a-1) providing a substrate with a flat upper surface;

(a-2) forming a sacrificial layer on the upper surface of the substrate at positions corresponding to where [[of]] the acoustic resonant portions are to be formed in the step (c); and

(a-3) forming a membrane layer on the substrate so that the sacrificial layer ~~on the~~ substrate is covered by the membrane layer; and

the method further comprises, after the step (c), the step of (d) removing the sacrificial layer so as to form an air gap.

16. (currently amended) The method ~~for producing a FBAR device~~ as set forth in claim 10, wherein:

the step (a) includes:

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- (a-1) providing a substrate with a flat upper surface;
 - (a-2) forming a sacrificial layer on the upper surface of the substrate at positions corresponding to where [[of]] the acoustic resonant portions are to be formed in the step (c); [[and]]
 - (a-3) forming a membrane support layer on the upper surface of the substrate so that the sacrificial layer is surrounded by the membrane support layer; and
 - (a-4) forming a membrane layer on the membrane support layer and the sacrificial layer; and
- the method further comprises, after the step (c), the step of (d) removing the sacrificial layer so as to form an air gap.

17. (currently amended) The method for producing a FBAR device as set forth in claim 15, wherein the membrane layer is made of a silicon nitride or a silicon oxide.

18. (new) The FBAR device as set forth in claim 7, wherein the membrane layer is made of a silicon nitride or a silicon oxide.

19. (new) The FBAR device as set forth in claim 1, wherein the substrate structure is a reflective layer in which two or more layers with different impedances are alternately stacked.

20. (new) The method as set forth in claim 16, wherein the membrane layer is made of a silicon nitride or a silicon oxide.